Achieving Better Acquisition Outcomes

GAO's 2008 Assessment of Weapon Programs
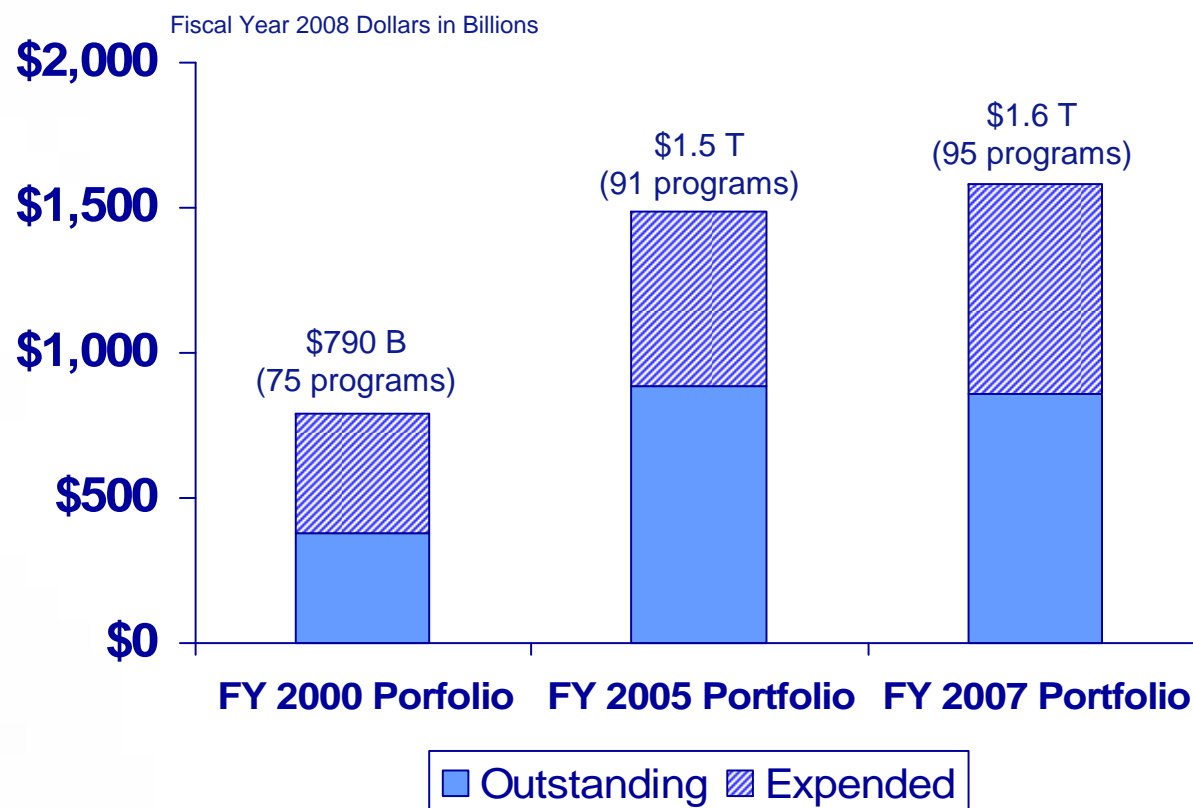
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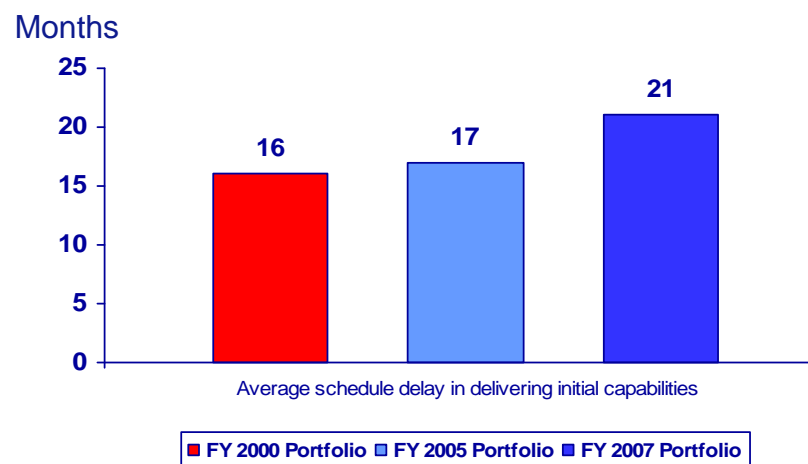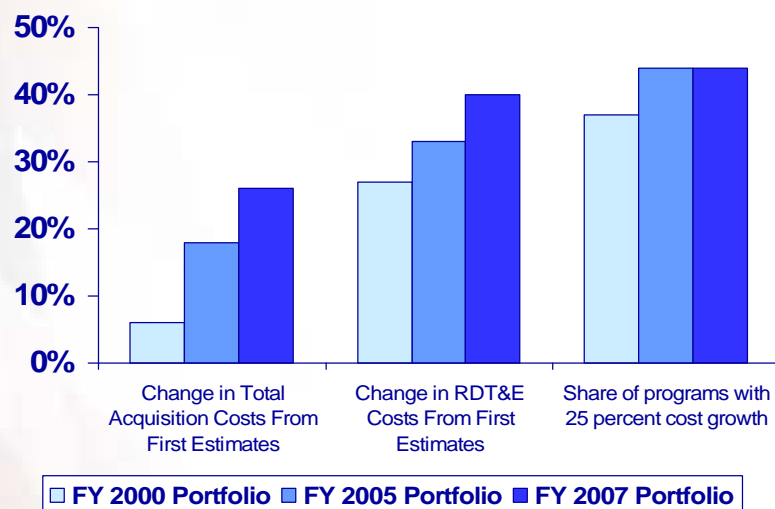
Major Weapon System Portfolio Analysis

- We assessed cost and schedule performance of DOD's portfolio of 95 Major Weapon System programs

  - Data was obtained from Selected Acquisition Reports

  - Missile Defense Agency reports only one SAR for its systems

DOD Has Increased Its Commitment In Major Defense Acquisitions Programs…..

Fiscal Year 2008 Dollars in Billions

$790 B
(75 programs)

$1.5 T
(91 programs)

$1.6 T
(95 programs)

	FY 2000 Porfolio	FY 2005 Portfolio	FY 2007 Portfolio

■ Outstanding ▨ Expended

Source: GAO analysis of DOD data.

….But DOD Outcomes Are Not Improving
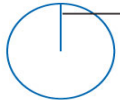
Source: GAO analysis of DOD data.

2008 Weapon System Assessment

- We assessed cost and schedule performance of 72 DOD programs

Little Evidence of Widespread Adoption of Knowledge-based Acquisition Process

- DOD's acquisition practices necessary to ensure effective implementation of knowledge-based process are not always followed despite policies and guidance to the contrary.

| Key junctures	Development start	Design review	Production start
	Knowledge point 1	Knowledge point 2	Knowledge point 3
Best practices	Mature all critical technologies	Achieve knowledge point 1 on time and complete 90 percent of engineering drawings	Achieve knowledge points 1 and 2 on time, and have all critical processes under statistical control
DOD outcomes[a]	12 percent of programs	4 percent of programs	0 percent of programs[b]

Source: GAO presentation of DOD data.

a Not all programs provided information for each knowledge point or had passed through all three key junctures.

b In our assessment of two programs, the Light Utility Helicopter and the Joint Cargo Aircraft, are depicted as meeting all three knowledge points when they began at production start. We excluded these two programs from our analysis because they were based on commercially available products and we did not assess their knowledge attainment with our best practices metrics.

Programs Enter System Development Without Mature Technologies

Percent of Programs Achieving Technology Maturity At Key Junctures
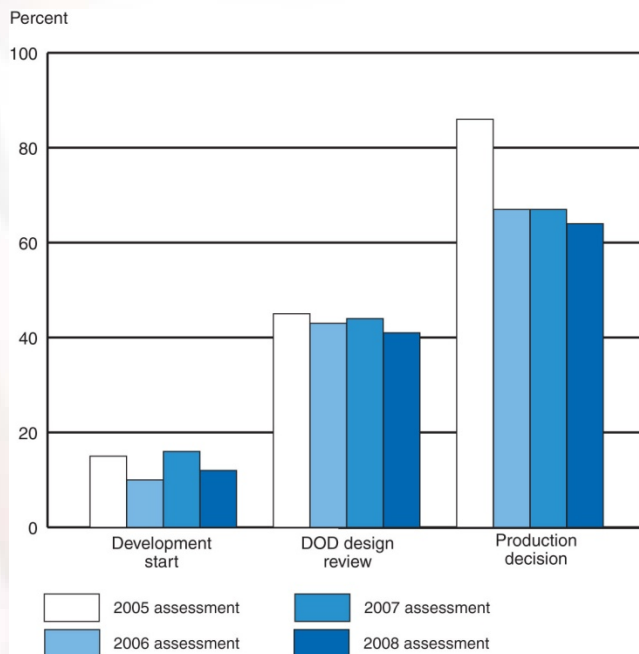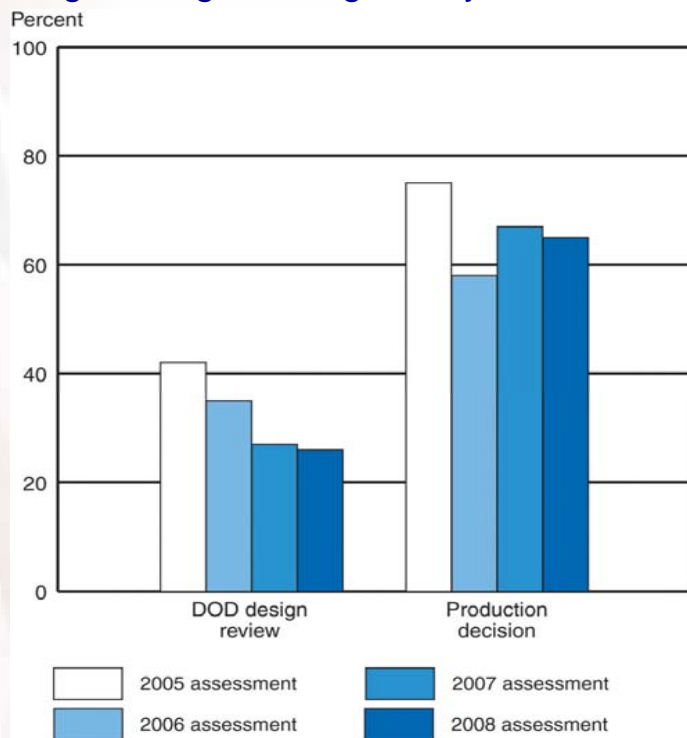

Percent

Source: GAO analysis of DOD data.

- 46 percent of technologies (164 out of 356) in immature state.

- Cost growth for programs with immature technologies was 44 percent higher.

- Less than 10 percent of programs had completed preliminary design review

Programs Continue to Move Into System Demonstration Without Achieving Design Stability

Percent of Programs Releasing 90 Percent of Engineering Drawing At Key Junctures

Source: GAO analysis of DOD data.

- Over half of programs did not have mature technologies by design review.

- More than 75 percent of programs did not meet drawings release best practices.

- Over 80 percent of programs did not demonstrate system integration through integration lab or prototype by design review.

Programs Enter Production Without Demonstrating Acceptable Manufacturing and Test Performance
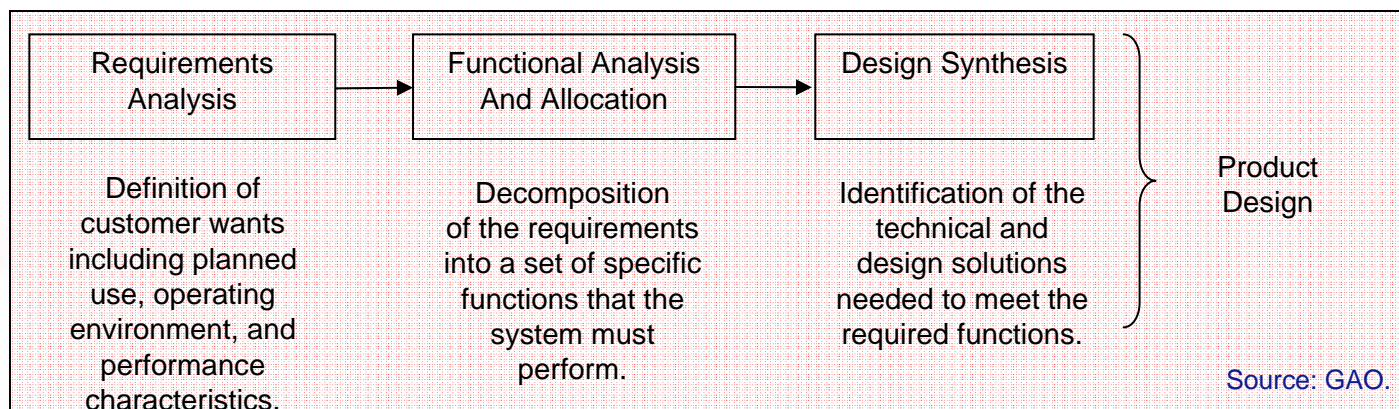
- Roughly one-third of the programs did not reach either technology or design maturity by production commitment.

- None of the programs that had production decisions provided data showing they had all their processes in statistical control.

- Many programs still had SDD activities remaining when entering production.

Underlying Deficiencies and Opportunities for Increasing Program Knowledge Early

- Systems Engineering and Business Cases

- Technology Transition

- Portfolio Management

- Program Management Turnover

- Cost Estimates and Full Funding

Systems Engineering Provides Evidence that Product Can Be Developed Within Resources

- Business case should provide evidence:
  - (1) Warfighter needs are valid and can be met with chosen concept, and
  - (2) The chosen concept can be developed and produced within resources-technologies, funding, design knowledge, and time.

- Early systems engineering enables a developer to identify and resolve gaps between resources and requirements before product development begins.

Requirements Analysis	Functional Analysis And Allocation	Design Synthesis	
Definition of customer wants including planned use, operating environment, and performance characteristics.	Decomposition of the requirements into a set of specific functions that the system must perform.	Identification of the technical and design solutions needed to meet the required functions.	Product Design

Source: GAO.

Solid, Executable Business Case Needed For Programs

- DOD often sets optimistic requirements that requires new and unproven technologies that cannot be met within available resources.

- While DOD's acquisition policy is informed with systems engineering rules, the absence of disciplined and timely practices leads to uninformed requirements.

- When early requirements analysis is not adequately performed to ensure DOD needs can be met within resources, increased costs risk to government can occur.

- Many programs have reset their business case at least once.

Stronger Practices Needed To Improve DOD's Technology Transition (GAO-06-883)

- Lacks the strong influence at the corporate level to guide the department's technology investments.

- DOD does not use gated processes with criteria that allows lab and program managers to know when technologies are ready for transition.

- Funding is not aligned to effectively and efficiently transition technologies to programs.

- Technologies are not mature when needed, forcing programs to pull them too early.

Integrated Portfolio Management Approach Needed For Weapons Investment (GA0-07-388)

- DOD largely continues to define warfighter needs and make investment decisions in a service-centric way.

- DOD also assesses warfighting needs and their funding implications under separate decision-making processes.

- DOD's approach impedes ability to prioritize needs so that it pursues not only the ones most important but also ones it can afford.

Frequent Changes to Program Management Reduces Accountability

- Frequent turnover makes it difficult to hold one program manager accountable for established business case.

- Program managers have little incentive to pursue knowledge-based approach as program funding is not tied to achieving knowledge.

- Lengthy program cycle times make program management longevity difficult.

Realistic Cost Estimates and Full Funding Needed (GAO-08-619)

- Program budget is established well before program begins.

- 5 or 6 year FYDP does not capture the "full" costs of programs.

- Cost estimates are optimistic and based on limited knowledge.

- Most estimates ("most probable cost") do not provide visibility into uncertainty and/or risk.

- Pressure to "fit programs into the FYDP" / competition for funding.

Observations On Actions Needed From Related GAO Work

- Establishing an enterprise-wide portfolio management approach;

- Constraining individual program requirements within available resources, leveraging systems engineering;

- Enabling science and technology organizations to shoulder the technology burden;

- Establishing sound, executable business cases;

- Establishing and enforcing controls to ensure that appropriate knowledge is captured and used at critical junctures;

- Holding program managers and decision-makers accountable.